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January 29, 1949

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

Baby Buzzards

See Page 68

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TECHNOLOGY DEPT

MEDICINE

New Vitamin B Reported

Named vitamin B_{14}, although in origin and function it resembles a hormone, scientists hope it will yield clues to cancer and pernicious anemia.

➤ A NEW B vitamin which may give clues to problems of both cancer and pernicious anemia is reported by Drs. Earl R. Norris and John J. Majnarich of the University of Washington at Seattle in SCIENCE (Jan. 14).

These scientists call the vitamin B_{14}, but say that in origin and function it may be more a hormone than a vitamin. It was isolated in crystalline form from human kidney excretions.

A tiny amount of this new vitamin checks the reproduction of cancer cells, specifically those of the Brown Pearce tumor, in test tube experiments. But it increases production of red blood cells in bone marrow. This effect also was found in test tube experiments.

The vitamin's effect on red blood cell production was about the same as that of enzyme systems in the stomach which are one of two factors necessary to prevent pernicious anemia. The enzymes act on anti-anemia substances, such as folic acid, to increase red blood cell production. But while vitamin B_{14} has the same effect as the chemical product of enzyme action on folic acid, the scientists do not think it is the same chemical.

Cancer authorities warn that while the vitamin's anti-cancer effect has theoretically important implications, a "wait and see" attitude must be taken with regard to practical applications. They point out that the road from test tube results to human applications is long and frequently disappointing.

Science News Letter, January 29, 1949

ASTRONOMY

Meteorites Identified

➤ METEORITE hunters can check their findings—free of charge—with the Smithsonian Institution in Washington to discover if what they picked up is really a pebble from heaven.

Fully 20 to 25 meteorites are sent there each month for identification, but few prove to be genuine. Slag or cinders are most commonly mistaken for meteorites, states E. P. Henderson of the Institution.

The Smithsonian has been collecting and studying meteorites for nearly 100 years. Today it has one of the largest collections in the world. If your find is better than specimens already on hand, they will undoubtedly offer you a good price for it.

Nearly 800 of these bits of rock from outer space have been collected by the Smithsonian. Some were actually seen as "shooting stars" to flash across the heavens before they struck the earth. Portions of two noteworthy stony meteorites observed to fall over Italy nearly a century ago have just been received.

The Smithsonian collection is remarkably complete. Specimens in the group represent 70% of all the known falls in the United States, and 52% to 55% of all the known falls of the world.

If you believe you have found a meteorite, compare its weight with that of other stones in the field. All meteorites are heavy, much heavier than the average rock. Examine it closely; meteorites never have cavities or pores like those found in slag or cinders.

A good idea of how a meteorite should look may be obtained by studying those in a museum or viewing pictures of the more famous ones. In general, meteorites are rounded or irregular.

Meteorites are roughly classified as iron and stony ones. An iron meteorite is the more easily identified, which accounts for the fact that museums have on hand many more of the iron variety. It is attracted by a magnet. It is easy to spot as chunks of metal are seldom scattered about. It is not brittle like stone. If scratched deeply with a file, a fresh metal surface is exposed.

A stony meteorite usually also contains a bit of iron. If you look around the field in which it is found, it differs greatly from other stones nearby. Great numbers of meteorites are rarely found in any one place.

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PHYSIOLOGY

You Can Hear Your Heart Beating in a Quiet Room

➤ YOU CAN hear your own heartbeat, without the aid of a doctor's stethoscope, when you are sitting alone in a very quiet room at night.

The sound will fool you if you are expecting a lub-dub. It is very faint and like gasping.

The reason you can hear it is because the ear drum is richly supplied with blood vessels, Dr. Robert W. Lawson, of the University of Sheffield, England, explains in a note to the British scientific journal, NATURE. (Nov. 13, 1948).

Each surge of blood through the arteries of the ear drum makes the drum swell slightly, he reasons. Each of these movements causes a little tap of the hammer bone in the middle ear which in turn starts the chain of stimuli that you recognize as sound.

Dr. Lawson first became aware of the ear giving a sensation in response to the heartbeat when he was listening to the radio. Listening to a humming sound, when the program was not on, he was conscious of a rhythmic pulsation in the intensity of the humming. Then, when burning damp logs in the fireplace, he noticed a similar rhythmic pulsation in the sound of the steam escaping from the ends of the logs. It was slightly more marked in the higher-pitched hiss produced when drops of water from the logs fell onto the hot bars of the grate.

The pulsation from the radio, he then noticed, was in time with that from the fire, and both were the same rhythm as his heartbeat, he found when he felt his pulse.

Being a physicist, Dr. Lawson next made some experiments with a beat-frequency oscillator fed to a pair of head phones. The pulsation effect was the same at frequencies from 50 cycles per second up to the limit of his hearing. Biting the teeth together firmly reduced the intensity when listening to a constant source of sound. This, be believes, is caused by a variation in the tension of the ear drum brought on by the muscular effort of biting.

Science News Letter, January 29, 1949

WILDLIFE

Good Bird Dogs Acclaimed As Aids in Conservation

➤ WELL-TRAINED bird dogs are recommended as game-savers by Dr. Ralph E. Yeatter of the Illinois Natural History Survey, Urbana, Ill., in a new publication, (BIRD DOGS IN SPORT AND CONSERVATION).

Their value is realized in two ways, Dr. Yeatter points out. The first is direct and obvious: hunters served by good retrievers capture crippled birds, quickly end their sufferings and add them to their legitimate bags. On the other hand, cripples often elude hunters without dogs and hide out while they slowly die; in the meantime the hunters go on and shoot other birds to complete their bags, since the cripples do not "count."

The second use of bird dogs in conservation is as aids to wildlife researchers. A wildlife man, however experienced, can make a better survey of a given nesting area if he has the assistance of the keener finding senses of a firstclass pointer or setter.

Science News Letter, January 29, 1949

GEOLOGY

Soviet Uranium Deposits

Russians have found enough uranium sources to make possible the development of atomic power in the future in Central Asia, scientist here believes.

➤ RUSSIAN efforts to build an atomic bomb may be concentrated in Central Asia in the Tashkent area. This is indicated in a survey of Soviet uranium deposits just published.

"A fair amount of authentic information" on Soviet uranium resources is available in this country, declares D. B. Shimkin of the Russian Research Center at Harvard University in the journal, SCIENCE, (Jan. 21). The Soviets have discovered enough uranium in the past decade to make it possible to develop atomic power in the future in Central Asia, Dr. Shimkin says.

No Soviet uranium deposits are known which are as rich as the two main sources of the element for American atomic work, deposits in Canada and the Belgian Congo. Dr. Shimkin does not discuss the rich Czechoslovakian uranium ore which Russia is believed to be mining behind the iron curtain.

Richest uranium ores known to be inside the USSR are in Central Asia.

"It must be stressed," Dr. Shimkin points out, "that all of the Central Asiatic deposits are found within a radius of 250 miles from the important hydroelectric plants of the Tashkent area. . ." Latest available figures show that water power developments in this area produced 882,000,000 kilowatt hours of energy in 1943.

"Labor, transportation and climatic conditions are also favorable here," adds Dr. Shimkin.

In addition to its relatively advanced industry, the Tashkent area has the advantage to the Russians of being remote from western nations.

The city of Tashkent, with an estimated population of more than half a million, is the capital of the USSR's Uzbek Republic. It is located north of Afghanistan and about 800 miles east of the Caspian Sea. The area was formerly called Turkestan.

Best known of the Central Asia uranium deposits is in the Fergana Valley, southeast of Tashkent. Prospecting for radioactive minerals in this area began in 1900, and expeditions to the region were sponsored by the old Imperial Academy of Sciences before the Russian Revolution.

Although fewer studies are known, two other areas may be termed promising for atomic ore hunting in the USSR, Dr. Shimkin reports. These are the region in Siberia between the Aldan gold fields and Lake Baikal and in western Russia in the Ukraine.

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PSYCHOLOGY

U. S. Prosperity Threats

➤ AMERICA'S two great fears are inflation and communism. That is, if a group of 5,000 city dwellers interviewed by the Psychological Corporation of New York are typical of the rest of us.

Asked what are the threats to a prosperous America, 49.5% listed inflation and 44.1% mentioned communism, Drs. Henry C. Link and Albert D. Freiberg, report to the JOURNAL OF APPLIED PSYCHOLOGY (Feb.).

Strikes and industrial strife are only "also-rans" as a source for worry, being listed by only 12.1%.

Surprisingly enough with communism looming so large as a threat, war talk and the threat of war were mentioned by only 10.6%. The Russians are a cause for uneasiness to only 1.6% and the atomic bomb frightens only 1.8%.

Contrasted with these very low returns are the following threats to a prosperous America: Politicians, political parties, politics—10.6%; Race prejudice and intolerance—8.8%; bad government, bureaucracy, graft, etc.—7.5%.

That America's city dwellers are not awake to the dangers of floods, drought, and wastefulness of resources is shown by the fact that only 3.5% mentioned these and similar threats as cause for alarm.

With regard to the civil rights issue, 77.6% said they believe that a program to teach white and Negro to get along together would do more good for American Negroes than passing laws to give them equal rights.

At the bottom of the heap of America's worries is the Taft-Hartley Act with only 0.3% considering it a threat to prosperity; 34% of union members consider that it has done more harm than good while 44% of non-union members think it has done more good than harm.

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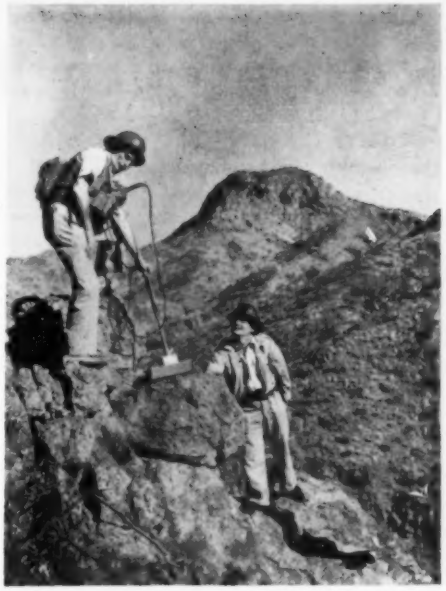

1949 URANIUM PROSPECTORS —These men are searching for radioactive deposits with a Geiger counter on Australia's Mt. Painter uranium field in the Flinders Ranges.

GEOLOGY

Mythical Serpent's Home May Be New Uranium Source

➤ THE SEARCH for the atomic bomb element, uranium, is being pressed in the land of Arkaroo, the giant serpent. Mount Painter, in the Australian state of South Australia, is the site of the renewed atomic prospecting.

Four hundred miles north of Adelaide, the mountain is in the remote Flinders Ranges. Nearby in the Gammon Ranges is the mythical home of the serpent, invented by the natives to account for strange rumblings in the earth. Geologists have identified the rumblings as subterranean rock movements. But the scientists have made a discovery much more important than the myth of Arkaroo.

Radioactive ores exist over a 100-square-mile area in the region of Mount Painter. This was first found several decades ago when radium was discovered. A small quantity of radium was obtained, but the radioactive ores of the region were largely neglected until 1944 when the Allies were secretly searching for sources of uranium.

An airstrip and road were built, but other sources of uranium elsewhere in the world were more promising, so development of Mount Painter again lagged near the end of World War II.

Now, a new program of exploration is under way, sponsored by the state government, to determine the quality and extent of the orces. If it is successful, Arkaroo's mythical home may be an important center in an atomic era.

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RADIO-AERONAUTICS

Redraft Radio Channels

➤ RADIO CHANNELS for use all over the world, for communication between planes in the air and control stations on the ground, present a number one problem for the representatives of 51 nations meeting in Montreal as members of the International Civil Aviation Organization.

The rapid growth of international air travel is responsible for the present situation. It has increased the necessity for reliable communication between aircraft and towers, and produced a serious scarcity of radiowave lengths available for such communication. The question now is how best to redraft the world pattern of frequency allotments to fit into the 149 radio channels in the high frequency bands available for the exclusive use of civil aviation on a worldwide basis.

Technical experts of the ICAO, at this meeting, have already begun a careful study of a proposed allotment plan, the work of the International Telecommunications Union, a special agency of United Nations responsible for allocation of all radio channels. The function of ICAO is advisory to the United Nations group, but the two are working closely together to get the greatest possible service from the frequencies available.

With only 149 frequencies available, careful planning is essential. During daylight hours a number of transmitting stations can operate on the same frequency without interference provided they are not too near each other. At night, however, radio signals travel greater distances and stations on the same frequency channel are likely to interfere with each other even when widely separated.

Limited radio spectrum space and rapidly developing civil aviation make planning difficult. Careful coordination is necessary to insure that the international air services of ICAO's 51 member nations make the best use of what is available. Communication procedures, adopted by the ICAO nearly a year ago, were reviewed at the meeting. It is estimated that improvements already resulting from the adoption of the procedures enable three circuits to handle the traffic that formerly required four.

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ENGINEERING

Harbor Maintenance Found Costly but Essential

➤ SOME $48,000,000 of taxpayers' money has been spent annually in the past seven years in American harbor and channel maintenance, the American Society of Civil Engineers was told in New York by Joseph M. Caldwell of the Army Beach Erosion Board. The work, however, is essential to keep the country prosperous.

Expenditures during the past seven years amount to about one-third as much as during the preceding century. They offer a challenge to civil engineers to save substantial amounts by effecting improvements in techniques, he stated. Most American harbors were deepened by man by dredging and tend to refill with sediments to normally-existing depths. Maintenance is largely dredging.

Mr. Caldwell urged the need of studies to determine means of lessening the rates of shoaling in harbors and navigation channels, and also of means to reduce the costs of dredging by increasing dredging efficiency.

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On This Week's Cover

➤ BABY BUZZARDS are odd-looking creatures. They are hatched out naked, but are soon covered with a thick coating of white down, as shown in the picture on this week's cover of the SCIENCE NEWS LETTER taken by George A. Smith of Quarryville, Pa.

As they begin to grow black feathers in place of their babyhood suits of white, the buzzards take on a mottled appearance of black and white. When full grown the turkey buzzard's head and neck are naked, and are red in color. Its plumage is glossy black, edged with grayish brown.

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Photographs: Cover, George A. Smith, Quarryville, Pa.; p. 69, General Electric Co.; p. 71, American Cancer Society; p. 74, p. 75, Westinghouse Electric Corp.

MEDICINE

Antidote to Spider Bite

A chemical called calcium gluconate has helped patients recover from the black widow's deadly bite. Doctors are alerted to her menace in this country.

➤ SUCCESSFUL use of a lime and sugar chemical, calcium gluconate, as antidote to the "kiss of death" delivered by the black widow spider is reported by Dr. William E. R. Greer of Boston University School of Medicine.

The six patients who all recovered when Dr. Greer injected this chemical into their veins were seen in a tropical overseas area. But the black widow spider can be met as far north as Cape Cod and New Hampshire, and in situations as remote from Pacific jungles as high office buildings in American cities.

One object of Dr. Greer's black widow report in the NEW ENGLAND JOURNAL OF MEDICINE (Jan. 6) is to alert fellow physicians to the black widow spider menace. The spider is present in all but seven states in America, he points out.

Victims may be mistakenly diagnosed as suffering from appendicitis or other acute surgical emergency, and operated on needlessly, he warns further.

The black widow poison is reported to be 15 times as powerful as rattlesnake venom. About an hour after a bite, the "victim writhes in agony, terror-stricken, and expressing fears of death."

Besides the excruciating pain at the bitten place, the burning sensation throughout the body, the widespread agonizing muscular pains and sometimes profound shock, the symptoms include burning of the soles of the feet. This last, Dr. Greer says, is characteristic enough to help the doctor to a diagnosis when there is doubt about whether the bite was from the black widow or something else.

The black widow can be recognized by the hour-glass shaped orange spots on her belly. She gets her nickname from her habit of capturing and killing the much smaller male "after he has served the ends of species preservation." She is a shy, timid and confused creature who attacks only when cornered or compressed, as between skin and clothing. "These spiders," Dr. Greer states, "are found in greatest numbers in the vicinity of human habitation, not only in outdoor privies as was formerly believed, but also in beds, garages, automobiles and tents."

About 60 different remedies or antidotes for black widow poisoning have been tried. The calcium gluconate Dr. Greer used successfully was first proposed by two other scientists, E. W. Gilbert and C. M. Stewart.

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ENGINEERING

New Building Code Issued

➤ SAFETY to life, as well as property, is the keynote of a new national building code issued by the National Board of Fire Underwriters in New York for voluntary adoption in whole or in part by state or local administrative authorities.

It is an "up-to-date" code, recognizing many new advances in building practice which are intended to ease construction costs. It recognizes the new modular dimensions being used in the manufacture of many building materials today. This means in four-inch, or multiples of four-inch, dimensions in building materials, including prefabricated panels for sidewalls or interior wallboard covering. Use of modular dimensional materials saves wastage of lumber and time on a construction job.

The code recognizes increased allowable stresses in lumber and steel, as a result of advances in quality control and experiences in the field. Another economy factor is the recognition of prefabricated flues in place of expensive masonry chimneys. In dwelling construction, the use of these flues results in considerable savings.

This new code, a revision of previous ones issued by the same organization and widely used in America, covers all types of building construction, including among others motion picture theaters, open air parking garages, and windowless structures now increasingly used in many types of buildings.

With modern air conditioning and lighting, windows are no longer necessary or desirable in certain types of buildings. But a building without windows provides a severe handicap to fire departments by denying access to a fire. The code covers this problem by requiring automatic sprinkler protection in such structures.

The new code may be obtained without cost by any person concerned with building construction from offices of the National Board of Fire Underwriters in New York, or in Chicago or San Francisco. Cities adopting the code may obtain 25 copies free, and additional copies at a nominal charge.

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NEW TELEVISION PICTURE TUBE—The new tube, which is shown above the seven-inch-diameter tube now used in low-priced sets, has a diameter of eight and one-half inches, and will offer 50% more picture area without additional cost.

ENGINEERING

Television Viewing Area Larger with New Tube

➤ A BIGGER television picture tube, revealed by General Electric and developed for use in low-cost receivers, will provide 50% more viewing area than the seven-inch tubes it will replace. It will handle a 39-square-inch picture.

First of its size ever designed, the new tube has a diameter of eight and one-half inches and will cost no more to build than the seven-inch tubes now in use in low-priced sets. It is a metal type. Other details are not yet released. Samples will be available soon. Heavy production will get under way during the year.

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GEOLOGY

Earth's Magnetic Field Is Same for 100,000,000 Years

➤ THE EARTH'S magnetic field has been pretty much the same for at least 100,000,000 years, a three-man field research team from the Carnegie Institution of Washington has discovered. They present their evidence in the PHYSICAL REVIEW (Jan. 1).

The three men, O. W. Torreson, Thomas Murphy and John W. Graham, cruised the western part of this country last summer in two specially equipped laboratory trucks. In various localities they carefully cut small blocks of sedimentary rock, and tested

these for the orientation of their minute magnetic fields.

The rocks thus tested were once loose sediment that settled slowly on the bottoms of ancient seas, in geologic ages from 100,000,000 to 10,000,000 years ago. Any of the particles that happened to be of magnetic material naturally arranged themselves in line with the earth's magnetic field. But after the sediments had compacted and slowly hardened into stone, the orientation of the particles had to remain the same even when the earth's magnetic field shifted—and it never remains completely still. Thus the rocks held the history of the magnetic field at the time of their first deposition.

Correlation of all field data shows that the earth's magnetic field during the whole 100,000,000 years has on the average been north-and-south, but with cyclic swings of 30 or 40 degrees on either side of true geographic north. This jibes very well with similar determinations previously made on much younger geologic formations: glacial clay deposits in New England, aged between 15,000 and 20,000 years, and million-year-old ocean-bottom samples brought up by a core-taking gun.

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ENGINEERING

Mining Production High

➤ ALTHOUGH 1948 production from American mines forged ahead of the output of the previous year, full demands for certain metals were not met, partly due to domestic postwar requirements and partly due to the rehabilitation needs of war-scarred regions abroad.

The tonnage of minerals, metallic and otherwise, mined in 1948 exceeded that of 1947 by about 4%, according to a preliminary report just issued by the U. S. Bureau of Mines. The dollar value was 26% higher. Fuels made the most impressive gain of any mineral group, with the value of mineral fuels produced increasing some 30%, partly a reflection of the record quantity of petroleum extracted.

Steel and aluminum production in 1948 surpassed the previous year output, but the major nonferrous metals, copper, zinc and lead, lagged behind. Large gains in the quantity of bauxite for aluminum making and molybdenum for steel alloys were achieved, though both were produced at rates a third below 1944 figures. Mercury production was exceedingly low, 40% lower than in 1947 and the smallest since 1933.

Iron and steel production in 1948 was the third greatest in history with some 88,000,000 net tons of ingots and castings. It would have undoubtedly equalled the 1944 peak of 89,600,000 tons, the report states, except for the work stoppage at coal mines in April and, with lesser effects, shortages in transportation for coke and pig iron. Labor-management difficulties account in part also for the shortages in the output of copper, zinc and lead.

The United States was obliged to import nearly two-thirds of its bauxite needs during the year, but the achievement of a peacetime record aluminum production was made possible partly by a peacetime record output of domestic bauxite. Magnesium output was intentionally held low, awaiting wider consumer acquaintance with the advantageous properties of this metal.

Crude petroleum production increased 8% over 1947, and exceeded 2,000,000,000 barrels for the first time. Marketed production of natural gas increased 10%. Coal production, both bituminous and anthracite, decreased, the first some 5% of the 1947 record output of 631,000,000 tons. The anthracite decrease was slight.

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ZOOLOGY

Young Rattlesnake Chokes To Death on Horned Toad

➤ HORNED TOADS aren't "pizen", but they can kill young rattlesnakes foolish enough to try to swallow them. Dr. Charles T. Vorhies of the University of Arizona tells of a recently born rattler that he found, choked to death on a small horned toad it had attempted to make a meal of. The spiny projections on the victim's head had pierced the snake's body wall. Deadlocked thus, both reptiles had perished.

Dr. Vorhies tells this story in establishing his point, that very young rattlesnakes are more apt to feed on lizards than on mice—for the horned toad, despite its popular name, is really a rather thick-bodied lizard. Slimmer lizards, with narrower skulls than those of mice, would slip more easily down the throats of the snakes, he believes.

Dr. Vorhies presents his discussion in the naturalists' journal, COPEIA (Dec. 31, 1948).

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PUBLIC HEALTH

Yellow Fever in Panama Would Be Worse in August

➤ PUBLIC HEALTH officials in Washington might be "a lot more worried" about the current yellow fever outbreak in Panama if it had occurred in August instead of January.

The disease, which at latest reports has killed six of its eight victims in the small town of Pacora, is carried by Aedes mosquitoes. We have plenty of them in this country. In the summer they extend as far north as a line running from Philadelphia to Los Angeles. But in the winter the Aedes boundary line is the Gulf Coast and Florida. It would be easier to fight them in this small region if they picked up the infection than in midsummer when they extend so much farther.

The yellow fever mosquitoes in Panama nest in the tops of trees. Health authorities believe the victims were woodcutters who got infected from mosquitoes they brought down as they were felling trees. A reservoir of the infection exists in monkeys and the tree-nesting mosquitoes get it from them.

The vaccine which has been flown to Panama from the U. S. Public Health Service laboratories at Hamilton, Mont., is expected to check the spread of the disease. The vaccine's protective action takes effect in nine days and lasts four years. It is not curative, however.

No specific treatment for yellow fever is known. Health authorities doubt whether even the new antibiotics, aureomycin and chloromycetin, active against so many diseases, would be effective in this one. They have not so far been effective against diseases caused by viruses as small as the yellow fever virus.

A check of air travellers to this country from Panama is being made by U. S. Public Health Service foreign quarantine officials. Names and destinations of those leaving will be wired or phoned to this country and the travellers will be met at the port of entry for examination. Disinfection of aircraft for mosquitoes is being double-checked.

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WILDLIFE

Rabbits Are Starving Deer by Overbrowsing

➤ RABBITS are killing deer—by starvation—the U. S. Forest Service reported.

Hunters in the East may have to hunt rabbits if they want to go deer hunting, officials warned. This is because rabbits are eating shrubs, bushes and seedling trees faster than deer, and the latter starve in some cases.

The real problem, in some Appalachian mountain areas, is saving overbrowsed areas where deer are now starving. In these areas, the food plants disappear faster than they can grow. Hunters in some parts of Pennsylvania have been encouraged to bag female deer to reduce the deer population.

But a Forest Service experiment showed that rabbit hunting, rather than shooting deer, may be the answer. In an overbrowsed area, deer were excluded, while rabbits were fenced out in half the area. Only slight recovery was noted in the area where rabbits still fed, while rapid recovery of plants was found in the section in which both rabbits and deer were kept out.

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ECONOMICS

Credit Came Before Money

Students of primitive tribes have found credit used in barter systems where money is unknown, a London economist explains.

➤ WHEN those bills pile up at the end of the month, you may get some consolation out of a scientific discovery: man used credit even before he invented money.

This and other scientific findings about the early use of money clash with what you will find in most economics books. And the economists, including old Adam Smith, are dead wrong, charges a London economist.

Dr. Paul Einzig takes his case to the scientists in the British journal, NATURE (Dec. 25). Ethnologists, the scientists who study today's primitive tribes, may know more about the early history of money than the economists, he points out.

Credit, the economics books generally explain, started long after money was invented, when cash dealings got too complicated. Scientists have found credit used in barter systems where goods are traded for other goods and money is unknown. Blacksmiths, for example, are paid in goods after harvest by farmers whom they serve the year around.

Actually, Dr. Einzig argues, credit is more important in barter dealing than in the modern money system. The blacksmith could be paid cash for each job after money came into use.

The invention of money, as the economists tell it, came when trading goods for goods became too involved. Ethnologists have discovered that the first use of money by primitive tribes is for such things as setting a price for brides, making religious sacrifices, paying subscriptions to secret societies or paying tributes, ransoms or blood money.

"It seems reasonable to assume," declares Dr. Einzig, "that money first developed to serve matrimonial, political or religious payments, and was only later adopted gradually for commerce."

When money does come to primitive tribes, it is, as you might guess, no economic "cure all." Economists tend to assert that money replaces barter. But studies of primitive peoples show that barter may continue to be, and is today, used even when money has been introduced.

The usefulness of barter has been underestimated, Dr. Einzig says. Some advanced ancient civilizations used barter, even though they had money. Some communities, he suggests, may have preferred to trade goods and services rather than cash.

Scientific findings differ with the economist's views on the origin of barter as well as of money. Barter began in the most primitive tribes when individuals split up the spoils of conquest, ethnological evidence indicates. Contrary to classical economics, barter started before division of labor and private property were established.

Dr. Einzig urges economists to study the findings of ethnologists about money, instead of accepting the "the vague and out-of-date observations on the subject in Adam Smith's 'Wealth of Nations'." And more monetary theory might help the scientists study the economics of primitive peoples, he concludes.

Science News Letter, January 29, 1949

MEDICINE

Need Contact Compression To Make Broken Bones Heal

➤ THE ENDS of broken bones must be in contact and under compression if they are to unite into one strong bone again.

Microscopic studies showing this were reported by Drs. G. W. N. Eggers, Thomas O. Shindler and Charles M. Pomerat, of the University of Texas School of Medicine at Galveston, at the meeting of the American Academy of Orthopedic Surgeons in Chicago.

Surgeons treating patients with broken bones can make use of these findings, which were made on rats, by applying the longitudinal compression forces of the patient's muscles, Dr. Eggers pointed out.

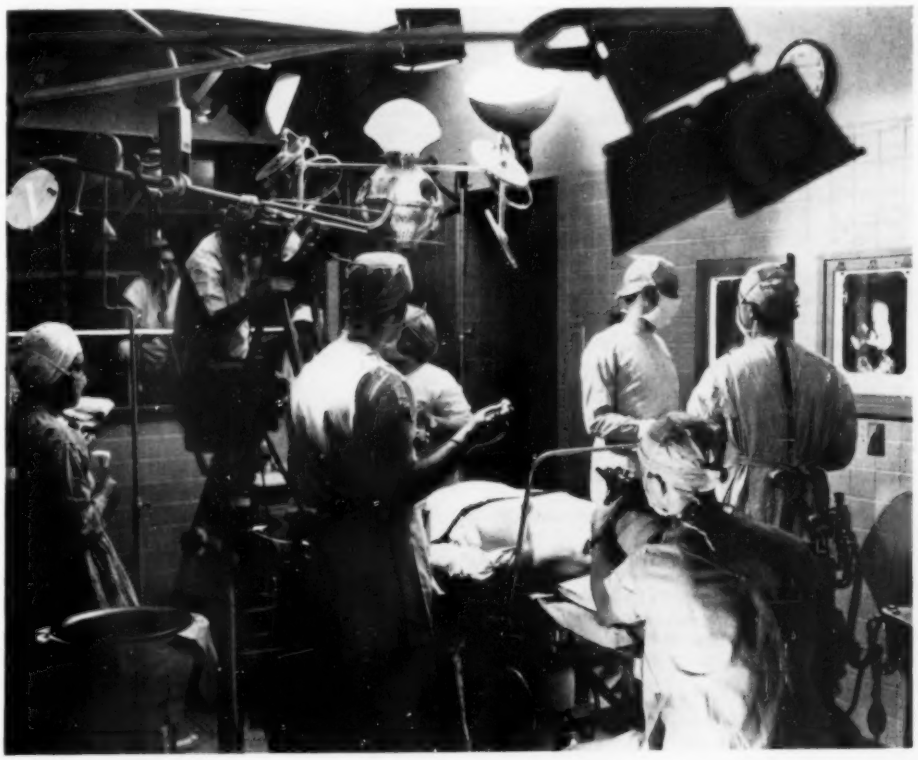
In the studies the Texas group examined under the microscope thin slivers of bones of rats that had been broken and then set.

"The bones which were under contact and compression united and the margins which were not under compression and contact did not unite," Dr. Eggers reported.

The work, he said, is "related to the basic fundamental physical principle which underlies the stimulation of osteogenesis (bone formation) and the healing of bone injuries. This experiment indicates a physiologic response to physical requirements to which bones are exposed."

Science News Letter, January 29, 1949

A chemical containing chlorine, bromine and methane, known as *chlorobromomethane,* is proving effective in fire-extinguishers in fire-fighting; it was developed in Germany early in the war but is now produced in America.

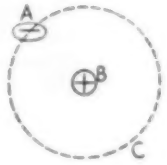


VISUAL CANCER EDUCATION—Doctors will be better able to grapple with this health foe as a result of a new medical training film "Cancer: The Problem of Early Diagnosis", which is produced jointly by the American Cancer Society, New York, and the National Cancer Institute, Bethesda, Md. Here the surgeons are inspecting an X-ray before starting an abdominal operation for cancer.

DIRECTIONS: Four possible answers are given for each question. Put an × in the parentheses in front of the number corresponding to that answer which you think is **most nearly correct.**

1. Plasmagene is a new term introduced into
   ( ) 1. astronomy
   ( ) 2. biology
   ( ) 3. geology
   ( ) 4. physics

2. In this diagram of the hydrogen atom,

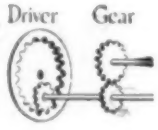


   ⊖ represents
   ( ) 1. a proton
   ( ) 2. a proton's charge
   ( ) 3. an electron
   ( ) 4. an electron's orbit

3. An *icosahedron* is a
   ( ) 1. form of electron tube
   ( ) 2. Mesozoic rock formation
   ( ) 3. pendent mass of ice
   ( ) 4. solid with twenty faces

4. Two kinds of devices—the spring scale and the balance—could possibly be used for measuring the mass of an object. Which one should be used?
   ( ) 1. either
   ( ) 2. neither
   ( ) 3. the balance
   ( ) 4. the spring scale

5. If the driver turns clockwise, the gear will



   ( ) 1. move back and forth
   ( ) 2. not turn
   ( ) 3. turn clockwise
   ( ) 4. turn counterclockwise

6. The simplest animals are
   ( ) 1. bacteria
   ( ) 2. crustacea
   ( ) 3. polyps
   ( ) 4. protozoa

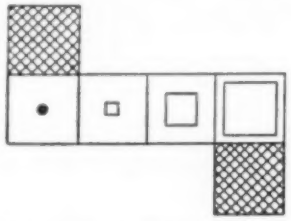
7. *Rh factor* is a term used in
   ( ) 1. astronomy
   ( ) 2. biochemistry
   ( ) 3. radiography
   ( ) 4. psychology

8. Each of three containers has a volume of 2,500 cc. One container is a sphere, one a cube, and one a cylinder whose diameter equals its height. Each container is made of glass of .08 cm. thickness. Which container has the least surface?
   ( ) 1. all have equal surfaces
   ( ) 2. the cube
   ( ) 3. the cylinder
   ( ) 4. the sphere

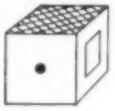
9. The basic formula for atomic energy was devised by
   ( ) 1. Karl T. Compton
   ( ) 2. Albert Einstein
   ( ) 3. Henry D. Smyth
   ( ) 4. J. R. Oppenheimer

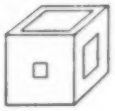
PART A

10. From the pattern



which of the figures can be made?

( ) 1. 

( ) 3. 

( ) 2.

( ) 4.

11. Which of the following normally flow from the cathode to the anode in a gaseous rectifier tube?
   ( ) 1. electrons
   ( ) 2. neutrons
   ( ) 3. positrons
   ( ) 4. protons

12. What is the missing word in the following sentence? "An emulsion is a mixture of two or more———liquids in which separation takes place very slowly."
   ( ) 1. concentrated
   ( ) 2. miscible
   ( ) 3. non-miscible
   ( ) 4. saturated

13. Amines are———of ammonia in which there is replacement of one or more———of ammonia by an———group, e.g., methyl or ethyl, or by an———group, e.g., phenyl or naphthyl. Which is the correct order for the four missing words?
   ( ) 1. derivatives—hydrogens—alkyl—aryl
   ( ) 2. derivatives—hydrogens—aryl—alkyl
   ( ) 3. hydrogens—derivatives—alkyl—aryl
   ( ) 4. hydrogens—derivatives—aryl—alkyl

14. Radioactive carbon, C^{14}, with a measured half-life of 5,000 years, is
   ( ) 1. not normally present in living tissue
   ( ) 2. present in all living things
   ( ) 3. present only in animals having a skeleton
   ( ) 4. present only in green plants

SECTION K: World's records for running are as follows:

100 yards— 9.4 seconds
220 yards—20.3 seconds
440 yards—46.4 seconds
880 yards— 1 minute 49.2 seconds
mile — 4 minutes 1.4 seconds
2 miles — 8 minutes 42.8 seconds
3 miles —13 minutes 32.4 seconds

SECTION D:

PART B

The diagram shows a pump.

SCIENCE APTITUDE TEST—This sample contains typical questions taken from the original three-hour examination given to high school seniors in the Eighth Science Talent Search conducted by Science Clubs of America, administered by Science Service. The test was devised by Dr. Harold A. Edgerton, and Dr. Steuart Henderson Britt, psychologists of New York City. If you want to see the complete aptitude test used, send two three-cent stamps to Science Service, 1719 N St., N. W., Washington 6, D. C. and ask for the science talent test.

TIONS SECTION K:

hich ...ill...strates the relation between speed
d dist...istance is measured from left to right,
d s...ordinate.)

) 1. ( ) 3.

) 2. ( ) 4.

...out h... times faster (speed) is the record for
...100-... than for the mile?

) 1.
) 2.
) 3.
) 4.

...out w...d be the speed for the half-mile run?

) 1. ...s per hour
) 2. ...s per hour
) 3. ...s per hour
) 4. ...s per hour

TIONS ...possible answers are given for each
...questi...05. Put an × in the parentheses in
... the ...corresponding to that answer which
...nk is ...ly correct.

...hich ...owing was invented first?

) 1. ...
) 2. ...ndescent lamp
) 3. ...cury thermometer
) 4. ...ty pin

Which ...owing is the most recent invention?

) 1. ...
) 2. ...n pen
) 3. ...pe compass
) 4. ...ter

...hich o...emical elements was first discovered?

) 1. ...
) 2. ...
) 3. ...n
) 4. ...

...bout ...r was the autogyro invented?

) 1. ...
) 2. ...
) 3. ...
) 4. ...

...hich ...owing is the most recent invention
... devel...

) 1. ...gine
) 2. ...w
) 3. ...locomotive
) 4. ...y tank

...e are ...ses of levers:

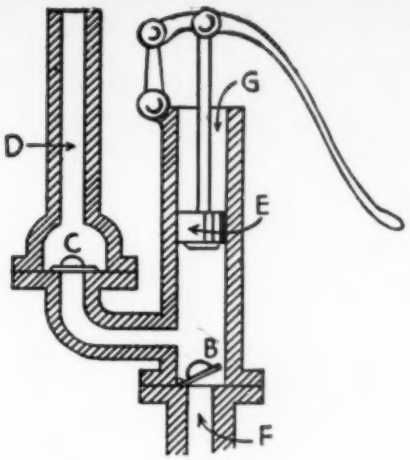
...ass A-...rum is between the effort and the
...e.

...ass B-...tance is between the effort and the

...ass C-...t is between the resistance and the

...e the ..., or C in the parentheses for each
...follow...icate which class of lever it is.

...06. C... ( ) 110. Scissors
...07. N... ( ) 111. Tweezers
...08. C... ( ) 112. Wheelbarrow
...09. F...



QUESTIONS FOR SECTION D:

61. In the operation of the pump, when the handle is raised,
( ) 1. valve B is closed and valve C is closed
( ) 2. valve B is open and valve C is closed
( ) 3. valve B is closed and valve C is open
( ) 4. valve B is open and valve C is open

PART C

Below are two lists. Each item in Column I is a prefix used in scientific terms. In Column II are listed the meanings of these and other prefixes. For each prefix in Column I, put the number of its meaning (from Column II) in the parentheses.

Column I		Column II
( ) 113.	ab-	1. across
( ) 114.	brachy-	2. away from
( ) 115.	cata-	3. behind
( ) 116.	dys-	4. being
( ) 117.	ecto-	5. close to
( ) 118.	histo-	6. distortion
( ) 119.	iso-	7. downward
( ) 120.	juxta-	8. equal
( ) 121.	lalo-	9. external
( ) 122.	myo-	10. healthy
( ) 123.	neo-	11. imperfect
( ) 124.	onto-	12. long
( ) 125.	para-	13. muscle
( ) 126.	retro-	14. new
( ) 127.	syn-	15. pulse
( ) 128.	trans-	16. reasoning
( ) 129.	uni-	17. short
		18. single
		19. small
		20. speech process
		21. through
		22. tissue
		23. together
		24. toward
		25. without

Below are two lists. Each item in Column I is a symbol. In Column II are listed the meanings of these and other symbols. For each symbol in Column I, put the number of its meaning (from Column II) in the parentheses.

Column I		Column II
( ) 130.	≠	1. approaches equality as a limit
( ) 131.	≦	2. equals
( ) 132.	≧	3. is approximately equal to
( ) 133.	≮	4. is equivalent to, in terms of some modulus
( ) 134.	≡	5. is greater than
( ) 135.	÷	6. is identical with
( ) 136.	·	7. is less than
( ) 137.	≈	8. is less than or (at most) equal to
		9. is more than or (at least) equal to
		10. is not equal to
		11. is not greater than
		12. is not less than

GENERAL SCIENCE

Test Your Science Ability With Sample Problems

➤ HERE is science's super-quiz of the year. You can try it on yourself or your friends. It will tell you whether you have reasoning ability such as a scientist needs to make new discoveries and inventions.

Thousands of seniors of the nation's high schools, some of them your neighbors, have just taken the full three-hour science test, of which these questions are a part.

These young scientists were competing in the Eighth Annual Science Talent Search for the Westinghouse Scholarships and their papers are now being scored by the judges. Results will be announced shortly. The questions up to now have been kept secret.

Not even the most brilliant or successful scientist would be expected to get all the questions right. The questions do require the use of scientific aptitude or the ability to think things through to a logical and successful conclusion.

You may discover in taking the test that you have abilities that you did not realize you have. Not everyone should expect to have the abilities necessary for success in scientific research as only a very small percentage of our population can do creative investigational work.

In any event, trying the test will give you some idea of what abilities are necessary in a scientist. Don't worry if the test seems difficult.

Want to try the test? First, *don't* peep at the answers. Next, arrange to spend about 40 minutes of time during which you will not be interrupted. Finish all the questions in one sitting. When you are through, turn to the answers on page 78.

There are three kinds of questions. Answer all questions in Part A by putting an X in the answer box corresponding to the number of the answer which is most nearly correct. In the case of Part B, first read each paragraph and then answer in a similar way each of the questions based on the information given. In Part C answer as directed.

Now a few more hints about taking the test.

Don't expect to make a perfect score. No one of the thousands of boys and girls who have taken Science Talent Search examinations has ever made a perfect score. They are not expected to do so. Neither are you.

You may start in on the test and then not finish. Or you may take one look at it and say: "That is too tough for me." That is your privilege. No one is making you take the test.

The high school seniors were not required to take the test. They could walk out on it—and many of them did, thus withdrawing from the competition.

The test is made quite difficult intentionally in order to eliminate the persons

(*Turn to page 78*)

MEDICINE

Air War Waged on Germs

Killing air-borne disease-carriers by means of humidity, ultraviolet rays and glycol mist is being investigated in an attempt to check illness.

By LYDIA SCHWEIGER

➤ THE AIR you breathe may guard you against colds, 'flu, pneumonia and the like in the future. Three methods of killing germs in the air are being investigated by scientists.

They are:

1. Humidifying the air 50%.
2. Destroying the germs with ultraviolet rays.
3. Drowning them in an invisible mist of glycol.

Recent experiments indicate that the prevention of nose, throat and lung diseases by "aerial warfare" has become more than just a hope. Scientists at the University of Chicago report that a relative humidity of 50% promises to become a weapon against influenza, pneumonia, strep. throats and perhaps other air-borne diseases.

Influenza virus loses almost four-fifths of its ability to attack when the relative humidity is 50%, Dr. William Lester, Jr., of the University's department of medicine finds.

Dr. Lester exposed white mice to influenza A virus atomized into the air the animals breathed. The amount of virus that killed 100% of the animals at relative humidities of 30% and 80% killed only 22.5% of the animals when the relative humidity was 50%.

May Affect Other Types

The other types of 'flu virus and the virus that causes virus pneumonia may be affected in the same way, though Dr. Lester's report to the JOURNAL OF EXPERIMENTAL MEDICINE does not cover studies on these other viruses.

The striking power, or infectivity, of the air-borne influenza A virus decreased so rapidly at a humidity of 50% that it was impossible, Dr. Lester reports, to get a 100% mortality rate in the mice even by greatly increasing the amount of virus.

Salt seems to play an important part in the anti-virus and anti-germ effect of humidity. At 50% humidity all the mice died when exposed to virus free of salt.

These findings resemble closely those reported last winter by Edward W. Dunklin and Dr. Theodore T. Puck of the University. They discovered that a 50% relative humidity is rapidly fatal to Type I pneumonia germs, staphylococci and streptococci, although viruses were not included in their experiments.

The discovery that humidity kills germs may explain why such diseases spread rapidly at some seasons and not at others. It might give scientific evidence for the phrase, "pneumonia weather," used by our grandmothers.

They suggest using humidity in schools, offices, theaters and the like, to check the spread of disease.

The humidifying would have to be done exactly. A 50% relative humidity is rapidly lethal to the germs studied but they can survive a long time at higher and lower relative humidities.

At 50% relative humidity the pneumonia germs the scientists sprayed into an experimental air chamber were all dead in less than 10 minutes. But at relative humidities of 80% and 20% many germs survived for over two hours.

Humidity Not Uncomfortable

The 50% relative humidity that is deadly to germs would not be uncomfortable for humans indoors. Climatologists have found that whether the air is wet, dry or humid makes very little difference in comfort so long as the temperature ranges between 50 and 68 degrees Fahrenheit. That upper temperature level and the approximately 72 degrees Fahrenheit temperature of the studies with germs are fairly close to each other and to the usual indoor temperatures. Temperatures in the fifties and nineties make a difference in the germ-killing effect of humidity.

The 50% relative humidity kills the germs by dehydrating them to the point where they become most vulnerable to the action of sodium chloride, the ordinary salt we use for seasoning food. When the germs were suspended in distilled water, instead of broth, and then sprayed into the air, they did not die as fast at 50% relative humidity. But when sprayed from a salt solution, or from human saliva, which is the natural way they get into the air, they were rapidly killed, just as when sprayed from broth.

Measurement of the rate of settling of droplets showed that the disappearance of the germs from the air at 50% relative humidity was a true killing process and not a sign of collision of germs with the sides of the air chamber or with each other.

Air disinfection is another promising aid in checking epidemics of colds and influenza. Two methods that have been given extensive trial tests are sterilization with ultraviolet rays and glycol vaporization of air. Both of these methods do kill germs in the air and both have given remarkable results in various trials of their ability to stop or reduce the spread of air-borne disease.

Germ-killing ultraviolet light has for some time been used to check the spread of disease in hospital wards and school rooms and to cleanse the air about the patient in operating rooms. During the war, tests in military barracks in which ultraviolet irradiation of dormitories was done, resulted in a reduction in respiratory illness.

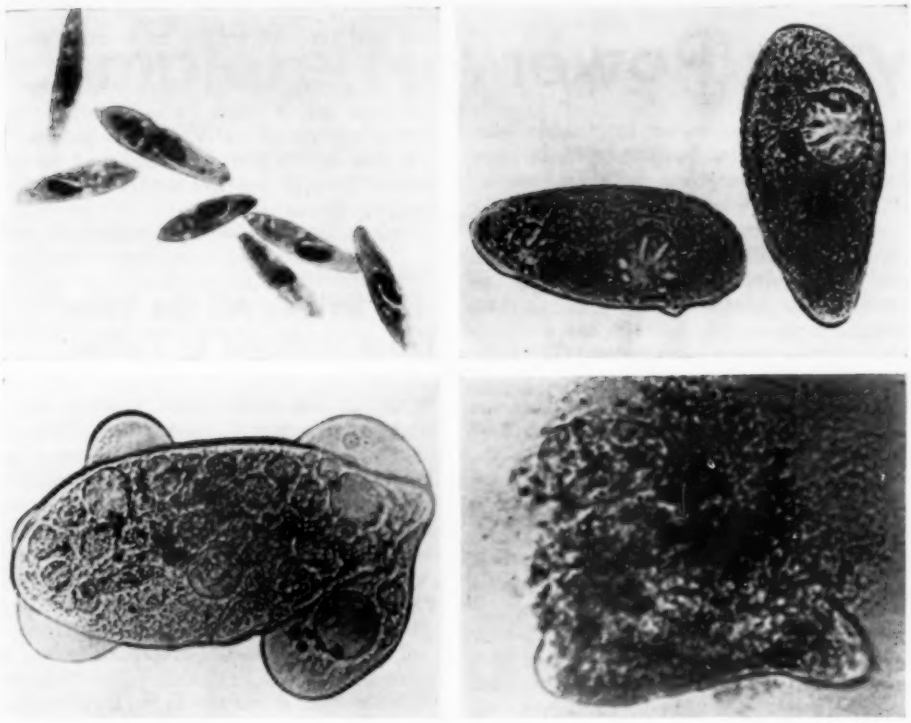
Lamps on Market

A number of sources of this ultraviolet energy, known as bactericidal lamps, are commercially available. Used in conjunction with air-conditioning units or ventilating systems, it purifies the air before it is circulated through the living quarters. The ultraviolet has no effect on the air itself, except for the production of traces of ozone, and is not absorbed by the air through which it passes.

There are several precautions which must be taken, according to public health officials. Because of the danger from over-exposure to ultraviolet light, installations must be made with care, in order to protect the body and the eyes. In addition, the ozone produced by the burning lamps might also be a danger if the air becomes stagnant.

The other scientific weapon, glycol sterilization of the air, has conclusively been proven effective in reducing the number of

KEEPING THE HOME GERM-FREE—Installed in a home's forced air-heating system, the Sterilamp pours out a barrage of bacteria-killing rays that purify the air.



LIGHT RAYS BRING EXPLOSIVE DEATH—Ultraviolet rays kill a microorganism by creating an internal explosion which burst the outer skin. In the upper left, are normal paramecia. After 30 seconds of exposure to a Westinghouse Sterilamp, they become distended, in the upper right. Cell walls continue to swell in the lower left, and the paramecium dies when its skin bursts, lower right.

bacteria in the air. However, no positive statement can yet be made concerning the effectiveness of glycol vapor in lowering the incidence of respiratory diseases.

The JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Oct. 2, 1948), in answer to the query of a physician, carried the following statement: "The use of triethylene glycol as a preventive for colds and virus infections is still highly experimental. We lack satisfactory evidence that under the conditions of use which would be practicable in a home, office or factory any significant diminution in the incidence of viral infections can be obtained."

Glycol vapor is sprayed into the air in a mist so fine it cannot be seen. It kills the germs floating on tiny droplets of moisture that may be coughed, sneezed or exhaled by the infected person because its molecules have an attraction for water. They penetrate the moist bacteria and overwhelm them with their chemical concentration. However, glycols are ineffective at humidities below 20% or above 80%.

This invisible, odorless and non-irritating chemical, called triethylene glycol, is a relative of the automobile and airplane engine antifreezes. The method of its use was developed by Dr. O. H. Robertson and associates of the University of Chicago.

Buildings with air-conditioning or ventilating systems can be equipped for glycol vaporization at small cost. Home atomizers are being manufactured that may prove effective in smaller quarters. Several chemical and pharmaceutical companies have installed this apparatus to maintain a sterile atmosphere.

At present, there are many technical problems which complicate the use of this method, such as regulating the humidity, taking bacterial counts to make certain the glycol has been applied properly, and use of dust control measures, for glycol has little effect against dust-borne bacteria.

Science News Letter, January 29, 1949

GENETICS

Photograph Apparent Genes With Electron Microscope

➤ GENES, which have become virtually an international issue since a recent Soviet ukase declared they don't exist, have apparently had their photographs taken with the aid of the super-magnifying electron microscope. The pictures appear in SCIENCE (Jan. 7), together with an explanatory article by the men who took them, Drs. Daniel C. Pease and Richard F. Baker of the University of Southern California.

They made sections less than one-twenty-five-thousandth of an inch thick of glands taken from the tiny heads of the gnat-sized little fruit-fly, the geneticist's special pet. On these they turned the searching electron beams, that show up in photographs details far beyond the reach of the highest powers of ordinary microscopes.

The photographs disclosed the presence, within the chromosomes, of small, fairly even-sized bits of matter, occupying positions that previous theoretical considerations, backed by mathematical calculations, indicated should be the positions of the genes, the hitherto invisible physico-chemical units that control heredity in plants and animals.

"It seems reasonable to suppose," state the two researchers, "that the discrete particles we have seen are genes."

Science News Letter, January 29, 1949

CHEMISTRY

New Soap Substitutes Can Help Fight Germs

➤NEW SOAP substitutes which kill germs as well as remove dirt were described to a local meeting of the American Chemical Society in Philadelphia.

A teaspoonful of the new detergents will produce a gallon of suds and match the germ-killing strength of a pound of carbolic acid. Uses can range from cleaning and sterilizing surgical instruments to washing household utensils.

Prof. J. B. Niederl of New York University and Prof. M. E. McGreal of St. John's University explained that the new "multi-cleanser" soap substitutes are called morpholinium alkyl sulfates. The new detergents are made entirely of organic chemicals and do not leave the caustic, slippery feeling on the skin that soap does, the chemists pointed out.

One out of every four or five pounds of cleansers bought for household use last year was a synthetic detergent, Drs. Arthur B. Hersberger and C. P. Neidig of the Atlantic Refining Company of Philadelphia reported at the meeting. This compares with only two percent for the synthetics in 1945 and less than 10% in 1946, they said.

Science News Letter, January 29, 1949

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AERONAUTICS

Atomic Energy for Power

➤ NOBODY should expect to see an atomic-powered rocket taking off for the moon this year or next, the Society of Automotive Engineers was told in Dayton, O., by Andrew Kalitinsky of the Fairchild Engine and Airplane Corporation. But atomic energy as a source of power for aircraft promises achievements unobtainable with standard fuels.

We have not manufactured an atomic power plant for aircraft, he said. The practical development of atomic energy as a source of power calls for active cooperation of both scientists and engineers, in research institutions and industry, if an early application of this power is to be made. Mr. Kalitinsky is chief engineer of the Fairchild project at Oak Ridge, Tenn.

Atomic aircraft will have to be designed to operate at very high speeds to take full advantage of the special characteristics of atomic power, he stated. It certainly will have to be a large airplane. It will have to be designed for an extremely high landing weight because practically no fuel will be consumed during flight. The crew will have to be placed as far as possible from the nuclear reactor to protect them from harmful radiation.

There are definite limitations on the possible performance of chemically fueled aircraft, since the required gross weight of the plane increases with both range and speed. For a given speed, the required gross weight increases rapidly with the range as the amount of fuel required increases. Therefore, he explained, if we try to design an airplane of greater range at this given speed, we can not do it no matter how large a plane we select.

Because of this limitation on the speed-range performance of chemically fueled planes, we must find a new fuel. Atomic power appears to be an extremely attractive solution if we are to extend range beyond the radius of current or projected aircraft carrying standard fuels. Our present supersonic airplanes run out of fuel in a matter of a few minutes. With atomic power, they could keep going because the fuel supply would remain nearly constant.

Science News Letter, January 29, 1949

WILDLIFE

Lizards for Snake Feed

➤ STATEN ISLAND in New York harbor has lizards, and they seem to like their new home in a borough of the nation's largest city.

Only trouble thus far, reports the scientist who brought lizards to Staten Island, is that they are in areas of the island infested with poison ivy.

C. F. Kauffeld of the Staten Island Zoo tells the story of the new inhabitants of the island in the scientific journal, COPEIA (Dec. 31). The zoo needed lizards to feed to its snakes. No lizards were to be found on Staten Island.

To remedy this defect in lizard distribution, northern fence lizards from southern New Jersey were released in the Rossville section on Staten Island's south shore in the spring and early summer of 1942. Some 28 of the lizards were turned loose on the island altogether.

The northern fence lizard, found in many parts of the country, is a grayish brown little lizard with a body about three inches long and a slightly longer tail. It will eat "any insect or spider it can catch and master," one authority has observed.

The war prevented Mr. Kauffeld from checking up on the lizards until 1945. He found several of them then and has since found more of them.

Difficulty in making more checks on the lizard colony has been "the outrageous prevalence of poison ivy," complains Mr. Kauffeld. If the lizards do not "spread more rapidly of their own accord," he says that he will put them in less treacherous areas of the island.

Since the lizards were marked when originally released, the Staten Island experience may help scientists learn more about the life span of these animals, their Staten Island sponsor suggests.

Formal name of Staten Island's newest form of wildlife is *Sceloporus u. hyacinthinus Green.*

Science News Letter, January 29, 1949

ENGINEERING

French Machine Lays Prefabricated Track Parts

➤ "WORKING on the railroad" almost automatically conjures up pictures of big gangs of men doing things the hard way —setting and tamping ties, spiking rails, bolting their ends together. But when you are confronted with the dilemma of a vast deal of railroad rebuilding and a shortage of manpower, prefabrication and mechanized assembly seems the so'ution.

That is what is undertaken in the track-laying system devised by a French engineer, A. L. C. Blondelle of Sartrouville, to whom U. S. patent 2,458,050 has been granted. His track-layer consists essentially of a low-clearance Gantry crane mounted on a special car. Factory-assembled sections of track, complete with rails and ties, are fed up to it from a car behind; the crane moves the track, a section at a time, out in front, and after it has been set in place by a ground crew moves out on it to repeat the process.

Rights in the patent are assigned to the Societe Enterprises Metropolitaines et Coloniales, S. A.

Science News Letter, January 29, 1949

PUBLIC HEALTH

'Flu Strikes All the Way From Holland to Turkey

➤ INFLUENZA has been striking Europeans all the way from southern Holland to Turkey, World Health Organization influenza watch stations abroad have cabled the Influenza Information Center at the National Institutes of Health in Bethesda, Md.

Scandinavia, Spain, Hungary, the American zone of Germany and the United Kingdom seem so far to have been spared.

The disease is mild but the number of cases is large. In France half the cases are due to type A virus. Type B virus has been isolated from cases in Italy but authorities are not sure it is "the main culprit."

At the Pasteur Institute in Paris and the National Institute for Medical Research in London scientists are trying to identify the responsible viruses. Hope of stopping epidemics by vaccines depends on knowing the virus strains causing the epidemics.

If new influenza virus strains are discovered they will be sent airmail from London or Paris to Dr. Thomas P. Magill at National Influenza Strain Study Center in New York for identification.

Science News Letter, January 29, 1949

CHEMISTRY

Prevent Potato-Sprouting With Relative of 2,4-D

➤ POTATOES in storage can be prevented from sprouting, and thus spoiling their marketability, by treatment with a chemical relative of 2,4-D that might appropriately be nicknamed 2,4,5,-T. Usefulness of this chemical was discovered in experiments by Prof. Ora Smith, J. H. Ellison and Fred McGoldrick of Cornell University.

Spelled out in full, the name of the compound is 2,4,5-trichlorophenoxyacetic acid. Other growth-control chemicals have been used in the past to check sprouting in potatoes, but 2,4,5-T has been found superior to those formerly used, the three researchers indicate in SCIENCE (Jan. 21).

Science News Letter, January 29, 1949

Portland cement, capable of hardening under water, takes its name from the British Isle of Portland because the British citizen who developed it thought it resembled the color of natural stone quarried on that island.

ORTHOPEDICS

Complete New Leg Brace

➤ A LEG BRACE prefabricated in parts which can be rapidly assembled and tailored to meet each patient's needs was demonstrated by Army medical scientists at the American Academy of Orthopaedic Surgeons meeting in Chicago.

The brace is of aluminum, which makes it 60% lighter in weight than steel braces. The prefabricated parts are now in mass production. Their ease of assembly means all types of brace fabricators can put the brace together and its cost will be within the means of those with limited funds for appliances.

Four advantages of the brace's "two-pivot" knee-joint are: 1. the free knee-joint, which approximates the sliding motion of the normal knee; 2. a joint in which the two pivot areas are controlled by a simple automatic lock mechanism; 3. a joint in which the two pivot areas are activated by a spring mechanism, which assists, or duplicates, the extension apparatus of the normal knee; 4. a joint to be used with the stiff or contracted knee, the two pivot areas being controlled by a centrally placed screw mechanism, which the orthopedic physician can adjust to exert a gradual, physiological corrective force on the knee deformity.

Additional advantages appear in the brace's ankle-joint, placed at ankle-height and allowing for interchangeability from shoe to shoe; and in the drop-foot mechanism, where a torsion spring is concealed in the ankle section of the brace to assist the polio patient in lifting the paralyzed foot in walking.

Completion of the new leg brace was made possible through the cooperative efforts of Army doctors and technicians, together with suggestions and requirements from the office of the Chief Medical Director of the Veterans Administration. Metallurgists of the Aluminum Company of America, as well as other technical groups, readily offered assistance because of their keen interest in the subject.

Science News Letter, January 29, 1949

ASTRONOMY

Historic Telescope Moved

➤ A SMALL, 10-inch telescope which has been used at Mount Wilson Observatory to study the Milky Way for more than three decades is being taken to South Africa by University of Michigan astronomers to finish its job.

The refractor telescope, installed at Mount Wilson in 1914, has been used to locate emission B (or Be) stars and planetary nebulae in our own galaxy, the Milky Way. About three-fourths of the Milky Way has been surveyed with the instrument at Mount Wilson, and the remaining fourth of the galaxy cannot be seen from there.

A University of Michigan graduate student, Karl G. Henize, will use the telescope at the University's Lamont-Hussey Observatory at Bloemfontein, South Africa, to study the rest of the Milky Way. The project, under the direction of Director Leo Goldberg of the University of Michigan Observatory, is expected to require approximately three years.

Be stars and planetary nebulae have been compared with an 80-year-old man on a football team who takes the ball and runs for a touchdown when no one can stop him. This would be as hard for a sports writer to account for as the changes that take place in planetary nebulae and Be stars are for astronomers to explain.

In the mystery of these objects in the Milky Way may be found the answers to important problems in physics, including the origin of high velocities and a possible relationship to nuclear physics, astronomers believe.

Planetary nebulae and Be stars are identified by the hydrogen lines in their spectra. Although similar to novae, their outbursts are believed to be less violent.

Science News Letter, January 29, 1949

PUBLIC HEALTH

$3,000,000,000 Water Bill Needed To Fight Pollution

➤ A $3,000,000,000 water bill is shaping up for federal, state and local governments.

This huge sum is needed to keep the nation's water clean, Maj. Gen. Philip B. Fleming, federal works administrator, told the New York State Sewage Works Association in New York.

To fight water pollution, Gen. Fleming said that 80,000 miles of new sewer lines and 12,000 new treatment plants are needed.

"New York state alone needs sewage works that would cost more than $1,000,000,000," the federal official said.

Science News Letter, January 29, 1949

ENGINEERING

New York City Water Supply 50% Greater in Five Years

➤ THE never-ending problem of supplying New York City with adequate water will be partly solved by 1954 when works on the upper Delaware river are completed, the American Society of Civil Engineers was told by Roger W. Armstrong, consulting engineer of the city's Board of Water Supply. A 50% increase in the city supply is expected.

Three impounding reservoirs on Catskill mountain streams are included in the project. One is on the East Branch of the Delaware river; the others are on Neversink river and Rondout creek. The project includes also a pressure tunnel aqueduct from the Rondout reservoir to New York City, with 25-mile and five-mile aqueduct tunnels bringing the water to the Rondout reservoir from the Neversink and Delaware respectively.

The total cost of this undertaking is expected to reach some $440,000,000. When planned, two decades ago, it was to be completed by 1939, and cost $273,000,000. Legal obstacles, plus material shortages, are responsible for the longer period required.

Science News Letter, January 29, 1949

ZOOLOGY

Do You Leave Bread Crusts? Rats Are Particular, Too

➤ HUMANS who leave the hard dry crusts of bread, eating only the soft center part, have their counterpart in rats, it appears from research reported in the journal, SCIENCE (Jan. 21), Drs. Anton J. Carlson and Frederick Hoelzel of the University of Chicago.

Rats often eat only the germ part of whole kernels of corn. Sometimes they also eat the white starchy part. But they leave the "flint-like yellow part of the separated kernels and separated skin," the Chicago scientists observed.

When the corn kernels were soaked in water for 25 to 48 hours, the rats ate all but the skin. These and further observations led the scientists to conclude that "the acceptance of food by rats, like the acceptance of food by man, is influenced more or less by the texture of the food."

Science News Letter, January 29, 1949

Science Service Radio

➤ LISTEN in to a discussion on "Magnetism at Work" on "Adventures in Science" over the Columbia Broadcasting System at 3:15 p.m. EST, Saturday, Feb. 5. Dr. Gustaf W. Elmen, internationally famous scientist and expert on magnetic materials, inventor of Permalloy and Perminvar, physicist at the Naval Ordnance Laboratory, White Oak, Md., and Edward Gaugler, physicist at the Naval Ordnance Laboratory, will be guests of Watson Davis, director of Science Service. They will tell the uses of magnetism in industrial research and will describe the way in which American physicists connected with the Navy were able to duplicate and simplify the production of a magnetic alloy made by the Germans.

Science News Letter, January 29, 1949

ENTOMOLOGY

NATURE RAMBLINGS

by Frank Thone

Useful Pariah

➤ FRIENDLESS in a cold world, the coyote skulks the plains and foothills, seeking the scraps and leavings that make his meager living. He is the Ishmael of the four-footed world, the haunter of waste places, always raiding and thieving yet never prospering. Nobody ever saw a really fat coyote.

Coyotes are in ill repute with ranchers and stockmen because they occasionally make off with lambs and stray calves. Similarly, rangers and wardens of wildlife preservation areas sometimes feel impelled to cut down their numbers.

Not for the poor coyote, however, are the determined hunts with dogs and guns that have all but exterminated their bigger cousins, the wolves, from the continental United States. Traps and poison baits are all he is likely to get, to help him out of a world that neither appreciates nor loves him.

Newest among the trap mechanisms, and nearest the coyote is apt to get to the dignity of death by gunshot, is a short-barreled firearm that goes off when he grabs a tempting bait. But instead of discharging a bullet, it only belches a charge of poison into his mouth.

Although every man's hand is against him, the coyote is far from useless. His very way of life, as a snapper-up of unconsidered trifles, gives him high usefulness as a natural instrument of control over rabbits, prairie dogs and smaller rodents that would otherwise get completely out of hand and devour so much of the range that nothing would be left for the livestock.

Moreover, since the coyote will eat anything he can get his teeth into, he is about the most effective disposer of carrion there is in the West—better even than buzzards and crows. A bear will eat more carrion than a coyote because a bear is bigger; but there aren't as many bears as there are coyotes, and bears don't wander the plains.

Finally, although we refuse to associate with the coyote while he is alive, we are not too proud to wear his castoff clothing after we have killed and stripped him. During the hey-day (or hey-hey-day) of collegiate fur coats a couple of decades ago, they were always called 'coonskin—but most of them were doctored-up coyote skin. And how many of today's luxurious "Siberian wolf" coats actually originate on the plains of Wyoming and Colorado must be left as a trade secret of the furriers.

Science News Letter, January 29, 1949

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From Page 73

who do not have perseverance to finish a job. This ability to finish what is started is a prime requisite for solving scientific problems, whether they be in atomic energy, disease control, industrial technology or in everyday life. Sometimes those who quit have reasoning ability, but it isn't useful to them unless they use it.

Doing well on this sample of the full test (which takes three hours to do) is creditable, but it does not mean that you can quit what you are doing and become a scientist. To be a professional scientist requires many years of study and preparation as well as native ability. But there are many situations in your daily work and life that require the same kinds of ability that scientists need.

Again don't look at the answers until you have finished the whole test. When you have finished, score the questions right or wrong. Count the number that are right. That is your score. You can rate yourself by comparing your score with interpretations given at the end of the answers.

After you have done the test you will appreciate the abilities of the boys and girls, 14 to 18 years of age, who win honors in the Science Talent Search.

These test questions are some of those used in one step in selecting the winners and honorable mentions of the Eighth Science Talent Search, conducted by Science Service as one of the activities of Science Clubs of America.

Forty top Science Talent Search winners from all parts of the nation will arrive in Washington March 3 for a five-day meeting with leading scientists at which thousands of dollars in scholarships will be awarded. An additional 260 contestants are being given honorable mentions and recommended to colleges, universities and technical schools as top-notch scientists of the future. In 18 states additional prizes and scholarships are being awarded to state winners.

The science aptitude test is only one of the techniques used in selecting boys and girls who are scientifically gifted. In addition each contestant filled out a personal data blank and wrote an essay describing some scientific project he has done or wishes to do. Teachers filled out a recommendation form and principals reported scholarship.

Taking the test and competing in the search comes as a culmination of high school science study and science club activity for thousands of boys and girls of America's public, private and parochial secondary schools.

Don't read further. Cover up the following paragraph until you have taken the test.

Correct answers to Part A are: 1, 2; 2, 3; 3, 4; 4, 3; 5, 4; 6, 4; 7, 2; 8, 4; 9, 2; 10, 4; 11, 1; 12, 3; 13, 1; 14, 2.

For Part B, Section K: 83, 2; 84, 1; 85, 2. Section D: 61, 2.

Part C: 101, 3; 102, 4; 103, 3; 104, 2; 105, 4; 106, A; 107, B; 108, B; 109, A; 110, A; 111, C; 112, B; 113, 2; 114, 17; 115, 7;116, 11; 117, 9; 118, 22; 119, 8; 120, 5; 121, 20; 122, 13; 123, 14; 124, 4; 125, 6; 126, 3; 127, 23; 128, 1 or 21; 129, 18; 130, 10; 131, 8; 132, 9; 133, 12; 134, 6; 135, 3; 136, 1; 137, 4.

Your score is the number you answered correctly. If your score is 35 or better, you may have a real talent for science. Average science aptitude is indicated by scores ranging from 21 to 34.

None of the questions was answered correctly by more than 90% of the high school seniors. The easiest ones were 1, 2, 5, 10, 11, 107, 109, 110, 111 and 112. Questions on chronology and scientific prefixes were the most missed. The "toughies" included 13, 14, 83-85, 105, 108, 114-122, 124-128 and 134-137.

If your score disappointed you, remember that this examination was not given to all high school seniors, only those with an interest in science. Most of them rank in the upper one-fourth of their classes.

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Sawdust is a good mulch for small fruits, especially blueberries.

One important industrial use of *silver* is in photographic films in which silver nitrate is the light-sensitive element.

Norway, a country in which *match-making* is a big business, is having a match shortage, although present production is greater than prewar output; exports to match-hungry nations are blamed for the local condition.

Books of the Week

TO SERVE YOU: To get books, send us a check or money order to cover retail price. Address Book Dept., SCIENCE NEWS LETTER, 1719 N St., N. W. Washington 6, D. C. Ask for free publications direct from issuing organizations.

THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC FOR THE YEAR 1950—U. S. Naval Observatory—*Govt. Printing Office*, 632 p., $3.50. The new edition of a world-renowned reference work.

THE ANCIENT FORESTS OF OREGON—Ralph W. Chaney—*Oregon State System of Higher Education*, 56 p., illus., paper, $1.00. Among the fossil leaves found there are those of the dawn redwood, and palm leaves where pines, firs and willows grow today.

CONTRIBUTIONS TO THE ANTHROPOLOGY OF THE SOVIET UNION— Henry Field—*Smithsonian Institution*, 244 p., 5 pl., paper, $2.00. A compilation of data based on Soviet published and unpublished materials, the majority of which were given to the author during his visit to the Academy of Sciences of the U.S.S.R. in 1945.

ENGINEERING METALS AND THEIR ALLOYS—Carl H. Samans—*Macmillan*, 913 p., illus., $7.50. A text giving background of metallurgy for those who must use metallic materials.

ESSENTIALS OF ZOOLOGY—U. A. Hauber—*Appleton*, 394 p., illus., $4.00. A college text in which the author avoids the traditional policy of isolation from world affairs because he feels that biology can be a civilizing influence.

GEOLOGY OF THE TESLA QUADRANGLE CALIFORNIA—Arthur S. Huey—*California Department of Natural Resources*, 75 p., illus., paper, $1.54.

HEALTHFUL LIVING—Harold S. Diehl—*McGraw-Hill*, 3d ed., 595 p., illus., $4.50. For individuals who want to enjoy a healthy life and avoid quacks, fads and unnecessary worries.

HEARING IS BELIEVING—Marie Hays Heiner—*World Publishing Co.*, 126 p., $2.00. The autobiography of the president of the Cleveland Hearing and Speech Center who is herself hard-of-hearing.

HISTOPATHOLOGY OF IRRADIATION FROM EXTERNAL AND INTERNAL SOURCES—William Bloom—*McGraw-Hill*, 808 p., illus., $8.00. The first of a series of books prepared as a record of the research done under the Manhattan Project—the report of three years of intensive war research.

MICROWAVE ANTENNA THEORY AND DESIGN—Samuel Silver, Ed.—*McGraw-Hill*, 623 p., illus., $8.00. For the antenna engineer.

MIRROR FOR MAN: The Relation of Anthropology to Modern Life—Clyde Kluckhohn—*McGraw-Hill*, 313 p., $3.75. A book for layman giving a basis for that understanding of other inhabitants of this world which is essential for living together peacefully.

PLANT ECOLOGY—W. B. McDougall—*Lea & Febiger*, 4th ed., 234 p., illus., $4.00. For students, gardeners, and others interested in the relation of plants to their environment and to man.

PRINCIPLES OF PETROLEUM GEOLOGY—Cecil G. Lalicker—*Appleton*, 377 p., illus., $5.00. A text devoted to a very popular branch of geology.

A PROGRAM FOR THE NURSING PROFESSION—Committee on the Function of Nursing—*MacMillan*, 108 p., $2.00. A group of experts in various fields of medical and social sciences report their studies of problems centering around current and prospective nursing shortages.

Science News Letter, January 29, 1949

ICHTHYOLOGY

Leapfrog-Playing Shark Is Reported by Scientist

➤ THE SHARK that played leapfrog is not just another fish story. It is the strange event reported by a scientist at the Scripps Institution of Oceanography in La Jolla, Calif.

The shark was spotted by John D. Isaacs of the Institution about 60 miles off the mouth of the Columbia River in the Pacific Ocean. The frisky shark, about seven feet long, leaped onto and then slid over a corrugated paper box.

It kept on leaping on the box about six times until the box was broken, Mr. Isaacs said.

More leapfrogging, this time by topsmelt fish, is described by Dr. Carl L. Hubbs of the Institution. Dr. Hubbs watched several topsmelt leap over a floating stick for nearly 15 minutes near a pier. These smaller fish, about six to nine inches long, seemed to find the sport contagious. Toward the end of the performance, Dr. Hubbs observed as many as ten of the fish jumping over the middle of the stick in close succession.

In reporting the cases of the leapfrogging fishes to the journal, COPEIA, (Dec. 31, 1948), Dr. Hubbs raises the question of why the fish jump. Is it, he asks, to remove parasites, or is it just "an outlet for exuberant spirit," or both? More scientific studies of "jumpy" fish will be needed to find the answer.

Science News Letter, January 29, 1949

MEDICINE

Blue Dye Saves Patient From Bleeding to Death

➤ A BLUE DYE, hailed for its potential usefulness in the event of atom bombing, rescued one woman in Shreveport, La., who was bleeding to death and made comfortable the last days of another patient.

These cases, showing the value of the dye in peacetime medical practice, are reported from the Shreveport Charity Hospital by Drs. J. E. Holobek, J. V. Hendricks and W. J. Hollis in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Jan. 22).

The dye is toluidine blue. Its ability to control a bleeding tendency, such as follows large doses of ionizing radiations from the atom bomb or other sources, was suggested in studies by Dr. J. Garrott Allen and associates of the University of Chicago.

One of the Shreveport patients was practically dead from blood loss through oozing from the mucous membranes of her mouth and bowels and from tiny hemorrhages in her skin. Blood transfusions had no effect. The dye was injected into her veins and the bleeding stopped "dramatically." She recovered and has had a normal blood cell count for the past year or more.

A second case was a woman suffering from leukemia. The dye could not save this patient's life, but its dramatic effect in stopping the oozing and vomiting of blood kept her comfortable during the last week of her life.

In a third patient, the dye had no effect. This patient's bleeding was apparently caused by a different condition than the excessive heparin in the blood which the dye counteracts. She recovered after having her spleen removed.

Science News Letter, January 29, 1949

ZOOLOGY

Bands on Bats' Legs Show They Can Live Eight Years

➤ BATS of the species designated as Big Brown can live as long as eight years, it has been proven by identification bands on the legs of two individuals recently caught hibernating in a cave in Quebec by A. W. Banfield of the Dominion Wildlife Service, Ottawa, Ont. Records showed that the bands had been attached to their legs eight years and three months before the date of their recapture.

Reporting this proof of bat longevity in the JOURNAL OF MAMMALOGY (Nov., 1948) Mr. Banfield also mentions evidence that the bats apparently didn't like the shining anklets which their earlier captors had bestowed on them. Many of the identifying bands had been chewed and were practically illegible.

Science News Letter, January 29, 1949

HOUSES OF EARTH

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⚙ *PAINT SPRAYER for household use, which can be used also to handle disinfectants or any sprayable material, is a four-pound unit including a quart paint container and an electric motor. It is easily held in one hand with its pistolgrip and it operates on the ordinary household electric current.*

Science News Letter, January 29, 1949

⚙ *LIGHT-WEIGHT WRENCHES, of the pipe-wrench type, are made of aluminum with jaws of steel, and weigh less than half as much as older types in use. This aluminum product has the necessary strength to meet and surpass any ordinary requirements in heavy use.*

Science News Letter, January 29, 1949

⚙ *RULER FOR USE in ringbinder type notebooks has circular openings and slots so that it can be slid into the binder without opening the rings. The light-weight, transparent plastic ruler is suitable for pencil and ink ruling both on flat and curved surfaces.*

Science News Letter, January 29, 1949

⚙ *DICTATING MACHINE, an improved type shown in the picture, uses a seven-inch vinylite plastic disk which records 30 minutes of dictation and is light enough to mail for three cents. To put a disk on it, the cover is flipped open and the disk slipped into place, a one-hand operation.*

Science News Letter, January 29, 1949

⚙ *REFLECTIVE TAPE, for use on the rear and sides of buses and automobiles to make them visible at night, comes in rolls of plastic sheeting in which are embedded millions of microscopic glass beads and has an adhesive backing.*

Science News Letter, January 29, 1949

⚙ *DRY WALL KIT, for use in the home to repair gypsum wallboard joints, includes 60 feet of reinforcing tape, five pounds of joint cement, and a tough, resilient spreading knife made of a plastic. Knife and handle are molded in one piece, making the tool practically unbreakable.*

Science News Letter, January 29, 1949

⚙ *POSTAL SCALE, fountain-pen size and equipped with a clip to hold it in a pocket, is designed for weighing letters, and has on it an automatic first-class and airmail calibration chart.*

Science News Letter, January 29, 1949

⚙ *POWER TIMING LIGHT, for on-the-spot automobile ignition tests in broad daylight, is equipped with a brilliant stroboscopic bulb, similar to those used in high-speed photography, and is set in a synthetic rubber case for protection against electric shock.*

Science News Letter, January 29, 1949

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• Do You Know? •

Aluminum production is dependent upon a reliable and steady supply of electricity.

The Soviet Union has become Australia's sixth largest *wool* buyer.

Australia has one farm of 260,000 acres with 30,000 acres of it under cultivation.

North Dakota claims to be the number one American barley-producing state.

Oysters are good to eat the year around, but from May to September fewer are marketed because this is the spawning season.

In the process of making *whiskey* from grain only the starch is removed; the other nutrients are recovered and may be used for stock feed.

Fatal accidents in bituminous coal mines in America during 1948 caused some 200 less deaths than in 1947, which amounted to 990.

In properly mixed *concrete* every particle of the sand, gravel or crushed rock used is completely coated with the cement paste.

Romans developed a *cement* centuries ago satisfactory for construction; following the fall of the Roman Empire cement-making became a lost art until 18th-century scientists began working with hydraulic limes.

White oils, made from petroleum, are colorless like water; they have many uses including lubrication, as an ingredient in medicine, cosmetics and insecticides, and in rubber-compounding, paper, rayon and cattle and tree sprays.

Advantages of *ramie fiber,* now being grown in America, include the fact that it is several times stronger than cotton and has high immunity to shrinkage, mildew and abrasions; it can be combined easily with such fibers as cotton and rayon.

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